Patent Claims

1. A process for producing a layer system (1) having a substrate (4),
the substrate (4) having a recess (10) that is to be filled, which recess is filled with a first multicomponent material (13), in such a way
that the substrate (4) can then be coated (7) in the region of the filled recess (10),
the first multicomponent material (13) containing at least one undesirable component,
which adversely affects a property of the coating (7) if the at least one undesirable component diffuses into the coating (7),

characterized in that

in an intermediate step a second material (22) is applied only in the region of the filled recess (10), so that there is now very little if any diffusion of the undesirable component into the coating (7).

2. The process as claimed in claim 1,
characterized in that

the second material (22) covers the undesirable component of the multicomponent material (13) in the recess (10) and thereby acts as a diffusion barrier.

3. The process as claimed in claim 1, characterized in that

in an intermediate step a removal heat treatment is carried out,
so that at least one undesirable component at least partially passes from the first multicomponent material (13) in the recess into the second material (22).

4. The process as claimed in claim 3, characterized in that

the second material (22) is removed together with the at least one undesirable component which has been removed from the first material (13) following the removal heat treatment and prior to the coating of the substrate (4) with the coating (7), in particular by a grinding treatment.

5. The process as claimed in claim 1, characterized in that

the first multicomponent material (13) is a solder, which as at least one component includes at least one agent for reducing the melting point as an undesirable component.

6. The process as claimed in claim 5, characterized in that
the agent for reducing the melting point consists of boron or contains boron.

7. The process as claimed in claim 1, characterized in that

a soldering heat treatment is carried out using the first material (13) prior to the application of the coating (7), with the result that the first material (13) bonds to the substrate (4) in the recess (10).

8. The process as claimed in claim 3 or 7, characterized in that

the removal heat treatment carried out is a diffusion heat treatment or a soldering heat treatment.

9. The process as claimed in claim 1, characterized in that

the substrate (4) used is an iron-base, nickel-base or cobalt-base superalloy.

10. The process as claimed in claim 1, characterized in that

the coating (7) used is an MCrAlX alloy, where M is at least one element selected from the group consisting of Fe, Co or Ni, and X is yttrium and/or at least one rare earth element.

11. The process as claimed in claim 1, characterized in that

the layer thickness of the coating with the second material (22) is thin compared to the coating (7).

12. The process as claimed in claim 1, 2 or 3, characterized in that

the second material (22) used is chromium or chromium-containing compounds or alloys.

13. The process as claimed in claim 1, 2 or 3, characterized

in that the first multicomponent material (13) contains at least one undesirable component,
which forms an undesirable compound with the coating (7),
and in that the second material (22), during the removal heat treatment, forms a compound with the at least one undesirable component of the first multicomponent material (13).

14. The process as claimed in claim 1, characterized in that

the second material (22) is applied using a paste, a slurry, a tape or other processes.

15. A component which has been produced as described in one or more of claims 1 to 14.

16. The component as claimed in claim 15, characterized in that

the component is a turbine component of a gas turbine (100) or steam turbine.

17. The component as claimed in claim 15, 16, characterized in that

the component (1) is a turbine blade or vane (120, 130).

18. The component as claimed in claim 15, 16, characterized in that

the component (1) is a combustion chamber lining (155).

19. The component as claimed in claims 15 to 18, characterized in that

after it has been used, the component (1) is refurbished as described in one or more of claims 1 to 15.

20. The component as claimed in claims 15 to 19, characterized in that

the component (1) is a new component.

21. The component as claimed in claims 15 to 20, characterized in that

the component (1) includes a ceramic thermal barrier coating.